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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,087	07/31/2003	Jonathan Jay Bernstein	MA03-004	2028
31362	7590	06/19/2006		EXAMINER
JOANNE N. PAPPAS				CHOI, WILLIAM C
45 NAGOG PARK				
ACTON, MA 01720			ART UNIT	PAPER NUMBER
				2873

DATE MAILED: 06/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/631,087	BERNSTEIN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	William C. Choi	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 30 March 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1,2,4-13 and 16-20 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 10,11 and 16 is/are allowed.  
 6) Claim(s) 12 and 17-19 is/are rejected.  
 7) Claim(s) 1,2,4-9,13 and 20 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 17 January 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

### ***Allowable Subject Matter***

The indicated allowability of claims 12 and 17 is withdrawn in view of the newly discovered reference(s) to Moon et al (U.S. 2003/0095307 A1) in view of Patel et al (U.S. 6,867,897 B2) and in view of Drake et al (U.S. 6,200,882 B1). Rejections based on the newly cited reference(s) follow.

### ***Claim Objections***

Claims 1 (and dependent claims 2, 4-9, 19 and 20) and 18 are objected to because of the following informalities: in line 4 of claim 1, "titling" should be changed to "tilting"; in line 1 of claim 18, "where in" should be changed to "wherein". Appropriate correction is required. The dependent claims inherit the objection from their parent claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al in view of Patel et al.

In regard to claim 12, Moon et al discloses a spatial light modulator system comprising: a high fill factor MEMS array of tilting mirrors used to attenuate a plurality of wavelength channels in an optical network (page 5, sections [0093] & [0094], Figure 3); and an interface control circuit controlling said array of tilting mirrors (page 5, section [0093], lines 3-5, Figure 3, "90"), said interface circuit receiving and storing control signals to reconfigure wavelength channel definitions (pages 5 & 6, section [0094]) wherein each mirror in said MEMS array of tilting mirrors is supported by side support flexures (page 7, section [0108], Figure 11, "Hinge"), but does not specifically disclose wherein the rotational axis of said flexures is offset from the center of gravity of the mirror.

Within the same field of endeavor, Patel teaches that it is desirable for the rotational axis of the flexures of MEMS mirrors to be offset from the center of gravity of said mirrors for the purpose of providing a larger rotational angle for said mirrors (column 7, lines 21-59). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the rotational axis of the flexures of Moon et al to be offset from the center of gravity of the mirror since Patel teaches that it is desirable to do so for the purpose of providing a larger rotational angle for said mirrors.

Claim(s) 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al in view of Drake et al.

In regard to claims 17 and 18, Moon et al discloses a spatial light modulator system comprising: a high fill factor MEMS array of tilting mirrors used to attenuate a

plurality of wavelength channels in an optical network (page 5, sections [0093] & [0094], Figure 3); and an interface control circuit controlling said array of tilting mirrors (page 5, section [0093], lines 3-5, Figure 3, "90"), said interface circuit receiving and storing control signals to reconfigure wavelength channel definitions (pages 5 & 6, section [0094]), but does not specifically disclose wherein each mirror is said MEMS array of tilting mirrors further comprises means for maintaining mirror flatness.

Within the same field of endeavor, Drake et al teaches that it is well known in the art of MEMS mirrors to comprise means for maintaining mirror flatness (i.e. stiffener ribs located below the mirror plane) (column 13, lines 23-47, Figure 10, "411"). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the mirrors of Moon et al to comprise means for maintaining mirror flatness since Drake et al teaches that it is well known to do so in the field of MEMS mirrors.

Regarding claim 19, Moon et al further discloses wherein each of said MEMS mirrors is fabricated of a metal layer (page 7, section [0108], lines 7-8, Figure 11, "204").

### ***Allowable Subject Matter***

Claims 10, 11 and 16 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claims 10 and 11: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein each mirror in

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said MEMS array comprises a single tilting cantilever with an asymmetric flexure resulting in 2-axis rotation.

The prior art fails to teach a combination of all the claimed features as presented in claim 16: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit as claimed, specifically wherein each mirror has at least one landing electrode having a same potential as said mirror.

Claims 1, 2 and 4-9 would be allowable if rewritten or amended to overcome the objection set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claims 1, 2 and 4-9: a spatial light modulator system comprising a MEMS array of tilting mirrors supported by symmetrically located flexures and an interface control circuit as claimed, specifically wherein each mirror further comprises a means for providing strain relief.

Claims 13 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art fails to teach a combination of all the claimed features as presented in claim 13: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit wherein each mirror is supported by side support flexures whose center is offset as claimed, specifically wherein each mirror comprises means for providing strain relief.

The prior art fails to teach a combination of all the claimed features as presented in claim 20: a spatial light modulator system comprising a MEMS array of tilting mirrors and an interface control circuit wherein each of said MEMS mirrors is fabricated of a polysilicon or metal layer as claimed, specifically wherein said mirror layer is polished flat using a Chemical Mechanical Planarization technique.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (571) 272-2324. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W.C.  
William Choi  
Patent Examiner  
Art Unit 2873  
June 5, 2006

  
RICKY MACK  
SUPERVISORY PATENT EXAMINER